theory of Darwin, but to show that in some cases, at least, coral reefs are but the summit of an elevation formed by other agencies. In cases of subsidence the reefs are thick, while in regions of elevation, as in Florida, the coral reef is but a thin crust topping a bank of deposited matter.

MINERALOGY[1].

GRODDECKITE—A NEW ZEOLITE.—A. Arzuni describes a zeolite from St. Andreasberg, in the Harz, which, while closely resembling gruelinite in form and physical properties, contains iron and magnesia in place of pativis of the aluminum and lime, and is to be regarded as a new variety of gruelinite. It is described as occurring in small crystals upon calcite, containing in their form the rhombohedron, scaleushedron and hexagonal prism, and possessing a prismatic cleavage, and a hardness of between 3 and 4. The composition is:

SO_2	Al_2O_3	F_2O_3	CaO	MgO	Na_2O	H_2O
					(by difference)	
51.2	12.0	7.7	1.1	3.8	4.5	20.2 = 100

and the formula

$$(Mg\ Na_2)_2\ (Al_2\ Fe_2)_2\ S_9\ O_{26} + 13\ H_2O$$

is adduced, the mineral being regarded as a magnesia-iron gruelinite.

It is named from Dr. A. von Groddeck, the director of the museum at Clausthal, in which the specimen was found.

HERDERITE FROM MAINE.—Mr. U. E. Hidden, well known for his mineralogical discoveries in North Carolina, announces[2] the probable occurrence of the rare mineral Herderite at Stoneham, Maine. The crystals are short, truncated prisms, transparent to translucent, colorless or faintly yellowish. Hardness 5, sp. gravity 3. The crystals are orthorhombic with $I \lambda I = 116°$ It resembles topaz in form and color, but has neither the cleavage nor the hardness of that mineral. An analysis is now being made. Professor E. S. Dana gives some crystallographic measurements which closely approximate the angles of herderite.

RECENT METEORITES.—A large meteorite fell last February near Brescia, Italy. It was about half a metre long and of a conical shape. It buried itself a metre deep in the earth, singeing the grass in the neighborhood, and when dug out was still warm, and the smell of sulphur was distinctly noticeable. Although the meteorite passed through the air in a S. S. E. direction, it forced its way into the earth obliquely in an opposite direction.

About a year earlier, in February, 1882, a great meteor burst in a cloudless sky in Transylvania. A large ball of fire seen through-

[1] Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

[2] *Am. Jour. Sci.*, Jan., 1884, p. 73.

out western Transylvania suddenly burst, and three minutes after its disappearance a series of detonations was heard. The path of the meteor was for a long time marked by a grayish-white cloud. Some 3000 stones fell, the largest of them weighing over 38 kilogrammes. Analysis showed that they were stone-meteorites containing a percentage of 9.88 nickel-iron, 6.63 magnetic pyrites and 83.49 silicates.

THE FELDSPARS.—Speaking of the importance of a correct determination of the feldspars, J. Szabo[1] remarks "that it is the unanimous conviction with petrographers that every kind of a rock mass can be best determined by the mineral association found in it, and of all mineral it is the kind of feldspar which is most important. There was a time when we had been contented to say feldspar generally; then came a time when we said orthoclase and plagioclase; but now we know that this is not enough; we must discern among the plagioclases according to their basicity, at least an oligoclase-andesite, a labradorite, and a bytainite-anorthite." He states that in the case of an eruption, the most acid feldspars are the first product of eruption and the most basic the last, and that in many cases "the determination of the feldspar is the only possible way of saying something of the lithological and chronological character of the rock in question."

In order to determine the feldspar in the quickest way, he recommends flame experiments, and describes his method of work. It is based upon the coloration of the flame of a Bunsen burner by potash and sodium, and upon the degree of fusibility of the different feldspars, both being observed in the same experiment. A grain of feldspar of the size of a mustard seed is placed upon a loop of very thin platinum wire, and introduced into different parts of the flame. He distinguishes *seven* degrees of fusibility from Bronzite (1) to Stibrite (7), in each case holding the grain in the flame for one minute, and noting the degree of fusion. "Sodium is the element in the silicates which makes them easily fusible, the magnesium and aluminum render them less fusible or altogether infusible."

As to the coloration of the flame, he uses a solution of indigo in sulphuric acid, through which to observe the coloration by potash, and discovers five degrees in the yellow flame of sodium, and three degrees for the red flame of potash, the intensity of coloration depending upon the percentage of the alkali.

By combining these observations with an examination of the character of the fused globule, it is claimed that all the principal feldspars can be racognized. It is doubtful, however, whether a careful lithologist, unless made confident by long practice, would be sure of his determination by this method. The almost universal occurrence of a mixture of two or more feldspars renders any

[1]Proc. Amer. Assoc. Adv. Sci., XXXI., 270, 1882.

such method uncertain. Descloiseaux, in a recent paper,[1] has shown that although albite is the most constant of all the feldspars, it is subject to great variations, both as to homogeneity and optical characters.

Tschermak holds that the soda-lime feldspars are all mixtures of a soda feldspar with a lime feldspar, the proportions varying to form a continuous series from a pure soda feldspar (albite) to a pure lime feldspar (anorthite). Probably the only perfectly pure albite ever found occurs at Kasbék, Caucasia, where, according to Baerwald,[2] is a feldspar in which is no trace of lime or potash, and whose angles and specific gravity are almost identical with those calculated by Tschermak as belonging to a theoretically pure albite.

PSEUDO-SYMMETRY.—In the new edition of Pisani's excellent "Traité élémentaire de Mineralogie," the subject of pseudo-symmetry is treated substantially as follows: After referring to the labors of mineralogists by means of the polarizing microscope upon the internal structure of certain minerals, such as analcime, boracite, some garnets, etc., generally regarded as isometric, but shown optically to belong to another system; and after referring to similar researches upon crystals of the tetragonal, hexagonal and orthorhombic systems, such as idoclase, certain corundums, etc., which have led to the conclusion that the exterior envelope of all these crystals is the result of the grouping of interior polyhedrons arranged geometrically around a point; he remarks that these phenomena may be explained in most cases by an interior molecular transformation taking place *after* the formation of the crystal.

He states that it is only certain garnets from particular localities that have an anomalous structure, and that it is a singular fact that in no case does the external shape of pseudo-symmetrical crystals approach the form indicated by their interior system.

While admitting that the interior structure of a crystal may indicate another crystalline system than that generally admitted, Pisani recommends that each species should be placed in the system indicated by its *geometrical* form, at least until some more convincing proof to the contrary has been adduced.

MINERALOGICAL NOTES.—A new locality for topaz has been discovered near Platte mountain, Colorado, about twenty-five miles north of Pike's Peak. The crystals occurred in a pocket in decomposed albite. The topaz is either colorless or has a pale straw-color. Some of the fragments found indicated from their size the occurence of very large crystals. Associated with the topaz were crystals of microcline, gœthite, fluorite, etc. The largest microcline crystal found measured eighteen inches in the

[1] Bull. Soc. Min. de France, VI, 89.

[2] Zeitsch. f. Kryst., VIII., 48.

largest diameter.——E. Claassen has described some interesting crystals of pyrite from Parma, Cuyahoga county, Ohio. They form combinations of the cube, octahedron and pyritohedron, the cube predominating. The interesting feature of the crystals contists in the fact that the cubic planes are *concave*, the other faces being flat as usual. Some of the combination edges are therefore curved lines. The author supposes that the concave planes are the result of subsequent growth over a smaller normal crystal. It is more probable, however, that the raised edges are due to the more active growth which always occurs at the edges of planes, and which renders the edge harder than central parts of the planes. In quartz crystals the edge is often raised above the interior, and the same occurs in imperfect crystals of alum, salt, etc. The edges are first formed, and if the solution is exhausted, the planes are very apt to be concave.——Kosmann has published a description of the minerals of the ore deposits of the Muschelkalk of Upper Silesia. In addition to the various ores of zinc and manganese which are described at length, mention is made of an interesting discovery of a bed of asphalt in the deep workings of the Friederich's mine.——Now that asbestos in the many forms in which it is manufactured, is so largely used in mines, factories, furnaces, mills, steamships, etc., the demand for the raw material is great. Asbestos suitable for manufacturing purposes is not common. Even though the mineral may look well to a mineralogist, it may be worthless to the manufacturer. Not only is length of fiber necessary, but a certain toughness and elasticity is requisite, which many specimens do not possess. If it is at all altered or " rotten," it is without value.——Larger quantities of horn silver occur in Arizona, the ore being horn silver and native silver occurring in syenitic gneiss. Many mines have been opened, and many millions of dollars of silver already extracted. In a mine recently opened in the Turkey Creek district, $60,000 worth of silver was obtained in the first fifty feet sunk. Argentiferous sulphuret of copper has been discovered in Yavapai county, yielding copper and silver in abundance.——Rubellan has been shown by Hollrung to be an alterative product of magnesian micas, very variable in composition, by no means homogeneous, and certainly not entitled to a distinct name.——The Zircons found near Pike's Peak, Colorado, are very pure and transparent, and are occasionally of a deep emerald-green color.——Geinitz has described a pseudomorph of nacrite after fluorite, in which the nacrite partially filled a crystal of fluorite.——A *chromium diopside* has been found in the diamond mines of the Cape.——The blue color seen in some varieties of halite has been investigated by Wittjen and Prechi, who conclude that it is probably due to the presence of minute gas inclusions, producing the optical effect.——An examination of a boiler incrustation from Zwickau, proved that the main constituent was magnesium hydroxide, or *brucite*.